

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application in view of the following remarks.

Claims 1-20 are pending in the application, with claims 1, 9, and 14 being independent.

§ 102 Rejection

Claims 1-7, 9-18, and 20 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,944,133 B2 (Wisner et al.). This rejection is respectfully traversed.

Independent claim 1 is directed to a method of controlling a failover process in a data storage system including a host, a host bus adapter, a communication fabric including data paths, and standby and active storage controllers. The method includes detecting with the host bus adapter a failover condition; responsive to the detecting, operating the host bus adapter to match the failover condition to a particular failover action in a failover rule set; and performing with the host bus adapter the matched failover action.

Wisner et al. has not been shown to disclose or suggest such features.

Wisner et al. is directed to a system and method for providing access to resources using a fabric switch. Wisner et al. describes, with reference to FIG. 1, a system architecture 100 including data centers 102, 104 having data storage units 130, 132 (col. 3, lines 14-17 and col. 4, lines 62-65), the data storage units each including a controller 340 (col. 10, lines 13-40). The system of Wisner et al. also includes a director 106 (col. 3, lines 50-53) and an intelligent controller 108 (col. 7, lines 35-45). At column 7, lines 35-45, Wisner et al. describes that:

the fabric switch 124 may provide a mechanism by which the intelligent controller 108 may receive failure detection information from the centers' components. Further, the intelligent controller 108 may transmit control instruction to various components in the first

and second data centers via the fabric switch 124, to thereby effectively manage fail over operations. Alternatively, or in addition, the intelligent controller is also coupled to the WAN 160, through which it may transmit instructions to the data centers, and/or receive failure condition information therefrom.

However, Wisner et al. has not been shown to disclose or suggest "detecting with the host bus adapter a failover condition," as recited in independent claim 1. Rather, as described in Wisner et al., the failure detection information is received by the intelligent controller 108 "from the [data] centers' components." In fact, Wisner et al. never even mentions a host bus adapter, let alone that failover detection is performed by such a host bus adapter. The Office Action (at numbered paragraph 3, for example) appears to suggest that the intelligent controller 108 of Wisner et al. corresponds to the claimed host bus adapter. However, there is no disclosure or suggestion in Wisner et al. that the intelligent controller 108 is a host bus adapter.

Wisner et al. also fails to disclose or suggest "operating the host bus adapter to match the failover condition to a particular failover action in a failover rule set" and "performing with the host bus adapter the matched failover action," as also presently recited in independent claim 1. Instead, in Wisner et al., control instructions are sent by the intelligent controller 108 to manage failover operations.

Moreover, the cited portions of Wisner et al. fail to suggest that the intelligent controller could be modified to be a host bus adapter, or that the functions described as being performed by the intelligent controller could be performed by a host bus adapter. Therefore, one of ordinary skill in the art would not have been motivated to modify the system of Wisner et al. to include a host bus adapter.

For at least the foregoing reasons, independent claim 1 is allowable over Wisner et al.

Independent claim 9 is directed to a host bus adapter for managing failover and failback within a data storage system. The host bus adapter includes, among other things, a connector linking the host bus adapter to a processor of the host server; a port linking the host bus adapter to the communication fabric configured for transmitting and receiving digital information; and a failover mechanism detecting a redundancy failure in the data storage system and in response, initiating failover actions.

As discussed above, Wisner et al. makes no mention whatsoever of a host bus adapter, let alone a host bus adapter comprising "a connector linking the host bus adapter to a processor of the host server," "a port linking the host bus adapter to the communication fabric configured for transmitting and receiving digital information," and "a failover mechanism detecting a redundancy failure in the data storage system and in response, initiating failover actions," as recited in independent claim 9. For at least the foregoing reasons, independent claim 9 is allowable over Wisner et al.

Independent claim 14 is directed to a data storage system with redundant data storage. The system includes, among other things, a host bus adapter linked to the host processor and the communication fabric for selecting a path through the communication fabric to one of the active and standby controllers for providing the operating system device drivers with access to the data storage devices, wherein host bus adapter is configured to initiate a failover action selected from a set of failover actions.

Again, as discussed above, Wisner et al. makes no mention of a host bus adapter, let alone a host bus adapter that is "linked to the host processor and the communication fabric for selecting a path through the communication fabric to one of the active and standby controllers for providing the operating system device drivers with access to the data storage devices" and is

“configured to initiate a failover action selected from a set of failover actions,” as recited in independent claim 14. For at least the foregoing reasons, independent claim 14 is allowable over Wisner et al.

Dependent claims 2-7, 10-13, 15-18, and 20 depend from one of independent claims 1, 9, and 14, and are allowable by virtue of this dependency as well as for the additional features that they recite.

For example, **dependent claim 5** recites “determining with the host bus adapter if all active paths have failed and if all active paths determined failed, skipping the failover action performing when the host bus adapter determines either all other available paths have failed or a standby path is marked as unusable.” The Office Action acknowledges that Wisner et al. does not disclose such features, but asserts that they would be inherent because “[i]f all routs have failed then there would be no alternate route for the system, therefore it would have to skip the performance of the failover action” (Office Action, numbered paragraph 7).

Applicant respectfully disagrees, since the system of Wisner et al. could conceivably still perform a failover action, even though there are no active paths. “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.’” MPEP § 2112 (IV) (citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)). In this case, the system of Wisner et al. could perform a failover action even if there were no active paths. The fact that the failover action would likely be unsuccessful to connect the host with the standby data store does not *necessarily* mean that the failover action would not be performed. Accordingly, claim 5 is allowable for at least this additional reason.

Dependent claim 13 recites that “the failover mechanism presents a single logical unit number (LUN) entity to operating system device drivers in the host processor that is discoverable a plurality of times and wherein the failover actions are initiated without prior communication with the host processor.” The Office Action asserts that Wisner et al. teaches this feature at column 8, lines 20-33, column 9, lines 21-37 and 51-67, column 10, lines 1-13, and column 11, lines 8-28 and 53-64. Applicant respectfully disagrees. Contrary to the assertions in the Office Action, the cited portions of Wisner et al. make no mention of presenting “a single logical unit number (LUN) entity to operating system device drivers in the host processor that is discoverable a plurality of times,” as recited in claim 13. Accordingly, claim 13 is allowable for at least this additional reason.

Dependent claim 16 recites that “the failover operating circumstances require when an active path in the communication fabric fails that at least one path to the controllers is available and that a path to the standby controller is usable,” and is allowable for additional reasons similar to those discussed above with respect to claim 5.

Dependent claim 20 recites that “the host bus adapter presents a single logical unit number (LUN) entity to each of the operating system device drivers that is discoverable multiple times,” and is allowable for additional reasons similar to those discussed above with respect to claim 13.

§ 103 Rejection

Claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as being obvious over Wisner et al. in view of U.S. Patent No. 6,820,173 B1 (Bittel et al.). This rejection is respectfully traversed.

Claims 8 and 19 depend from independent claims 1 and 14, respectively, and therefore, each includes all of the features of its respective base claim.

Bittle et al. was cited for its alleged teaching of using anti-thrashing rules, but fails to remedy the deficiencies in Wisner et al. noted above with respect to independent claims 1 and 14 (assuming for the sake of argument that the documents could even be combined). Accordingly, dependent claims 8 and 19 are allowable for the same reasons as independent claims 1 and 14, from which they depend, as well as for the additional features that they recite.

Conclusion

For at least the foregoing reasons, claims 1-20 are in condition for allowance. Applicants respectfully request reconsideration and withdrawal of the §§ 102 and 103 rejections and an early notice of allowancc.

If any issue remains unresolved that would prevent allowance of this case, the Examiner is requested to contact the undersigned attorney to resolve the issue.

Respectfully submitted,

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